

Creating effective student engagement in online courses: What do students find engaging?

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Abstract: While this paper set out to discover what activities and/or interaction channels might be expected to lead to more highly engaged students, what it found was a bit different. After first creating a scale to measure online student engagement, and then surveying 186 students from six campuses in the Midwest, the results indicate that there is no particular activity that will automatically help students to be more engaged in online classes. However, the results also suggest that multiple communication channels may be related to higher engagement and that student-student and instructor-student communication are clearly strongly correlated with higher student engagement with the course, in general. Thus, advice for online instructors is still to use active learning but to be sure to incorporate meaningful and multiple ways of interacting with students and encouraging/requiring students to interact with each other.

Keywords: *active learning, online teaching, social presence, student engagement*

There are two primary reasons for studying student engagement in online courses. The first is that online courses are here to stay and growing so we need to do them well. The growth of online courses continues to rise dramatically. In fall, 2005 3.2 million university higher education students in the United States were taking at least one online course, up from 2.3 million the previous year (Allen and Seaman, 2006). The second reason is that one of the primary components of effective online teaching (or any other teaching, for that matter) is student engagement. Therefore, it is imperative that we learn what engages students in order to offer effective online learning environments.

I. Effective Online Instruction.

Research into effective online instruction offers three conclusions: 1) online instruction can be as effective as traditional instruction; 2) to do so, online courses need cooperative/collaborative (active) learning and 3) strong instructor presence.

A. As effective as traditional.

Several researchers have found that online students can and often do outperform traditional students (Maki and Maki, 2007). Maki and Maki (2007) found that students were often required to do more in online courses than in traditional courses. They also concluded that, to be effective, online instruction required strong methodology and opportunities for students to interact with each other and the instructor. Other researchers have echoed these findings, discovering that

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online students report learning more and spending more time on task (Robertson, Grant, and Jackson, 2005), being more engaged than traditional students according to the NSSE (National Survey of Student Engagement) averages (Robinson and Hullinger, 2008), having higher achievement and performing better (Conolly et al., 2007; Lim, et al., 2008). Like Maki and Maki, Zhao, Lui, Lai, and Tan (2005) reported that students do better with instructor interaction and communication. The potential for online courses to be as or more effective than traditional courses is there. What does it take to accomplish this? Other research indicates the potential may be realized with active learning strategies.

B. Cooperation/collaboration.

One of the recurrent themes in the literature is the effectiveness of using collaborative activities, group discussions, and other forms of student-student interaction. Gayton and McEwen (2007) found rapport and collaboration between students, thought provoking questions, and dynamic interaction among the top instructional processes identified by instructors and students. They believe an interactive and cohesive environment that includes group work, regular assignments, and solid feedback are needed for success. Levy (2008) found collaborative activities along with other interactions such as reading students' posts were valued by students. Graham et al. (2001) states that a "well designed discussion facilitates meaningful cooperation" (p. 2). Collaborative/interactive activities seem to be a necessary component to effective online instruction.

A few articles state that a variety of instructional methods are needed for effective online instruction (Chickering and Ehrmann, 1996; Gaytan and McEwen, 2007). However, only one researcher mentions specific strategies such as moving away from recorded lectures, readings, homework and tests toward more interactive and active learning environments like virtual teams, games, case studies etc. (Johnson and Aragon, 2003). Active learning is also touted as a way to engage students in the online environment (Chickering and Ehrmann, 1996). However, active learning, like collaboration, is a broad term and can encompass everything from students being given the opportunity to "talk about what they are learning" to students using simulation software and designing "radio antenna" (Chickering and Ehrmann, 1996). One area that deserves investigation is the specific types of active learning or collaboration in online courses that students find engaging. Thus, the first two research questions are posited:

RQ₁: What types of active learning in online courses do students report as engaging?

RQ₂: Is there a difference in the active learning activities reported by high engagement versus low engagement students?

C. Instructor presence.

The third conclusion from the literature is that instructors need to be actively involved in the learning of their students (Gayton and McEwen, 2007; Young, 2006). Instructors should be minimally active in discussions (Dennen, et al., 2007; Levy, 2008; Shea, Li, and Pickett, 2006; Young, 2006) and use email appropriately (Dennen, et al, 2007; Gayton and McEwen, 2007, Levy, 2008). Dennen et al. (2007) did find, however, that too much instructor participation in discussion boards etc. can actually decrease student participation.

Social presence of instructors and students is a concern of online researchers. Social presence is the phenomenon that helps translate virtual activities into impressions of "real"

people. Kehrwald (2008) defines social presence as “performative, that is, it was demonstrated by visible activity; posting messages, responding to others, and participating in the activities of the groups” (pp. 94-95). Such activities offer clues about the individual such as histories, personalities, and current circumstances and help online participants experience “other participants as both real in the sense of being a real person (a human being) and present in the sense of being there in (coexisting, inhabiting) the virtual environment.” (p. 95). “Effective design, facilitation, and direction of cognitive and social processes” are the defining activities of teacher presence according to Shea, Li and Pickett (2006). Several researchers feel that social presence, especially on the part of instructors, is a necessary component to effective online instruction (Dennen, et. al, 2007; Goertzen and Kristjansson, 2007; Hughes, 2007; Kehrwold, 2008; Shea, Li and Pickett, 2006).

Emphasis on the social presence of instructors makes sense in light of research finding that students need to feel connected to the instructor and other students in the course (Garrison, Anderson and Archer, 2001; Lewis and Abdul-Hamid, 2006; Russo and Campbell, 2004; Song and Singleton, 2004; Swan, 2002; Swan, Shea et. al., 2000) as well as to the content being studied. In an online course, where the risk of students feeling isolated is of greater concern (Lewis and Abdul-Hamid, 2006; Ortiz-Rodriguez, et al, 2005; Russo and Campbell, 2004; Song and Singleton, 2004), it may be more important that learning include student to student and student to instructor communication.

What communication activities between students and students and instructors are more likely to help students feel connected and engaged with the course? The last two research questions are:

RQ₃: What types of student-student communication are reported by highly engaged students versus students who report less engagement?

RQ₄: What types of student-instructor communication are reported by highly engaged students versus students who report less engagement?

Finally, given the previous conclusions, both instructor-student and student-student communication should be significantly related to the student’s report of overall engagement with the course:

H₁: Reported level of instructor presence will be significantly correlated with student engagement.

H₂: Reported level of student presence will be significantly correlated with student engagement.

II. Methods.

A. Instrumentation.

Because there was no scale to measure online student engagement, the first stage of the project was to develop a measure of student engagement in online courses. Two student engagement instruments and one measure of interaction within online courses were consulted: The Classroom Survey of Student Engagement (CLASSE) (Smallwood, 2006), the Student Course Engagement Questionnaire (SCEQ) (Handelsman, Briggs, Sullivan, and Towler, 2005) and the Rubric for Assessing Interactive Qualities in Distance Courses (RAIQDC) (Roblyer and Wiencke, 2004). Each of these instruments is a strong tool in its own right. None is appropriate for measuring student engagement in online courses. The first two instruments include items

such as “Came to class without having completed readings or assignments” (CLASSE) and “Raising my hand in class” (SCEQ). The RAIQDC, designed for online courses, asks students to rate such items as “By end of course, most students (50-75%) are replying to messages from the instructor . . .” rather than reporting their own experienced engagement with the course, students are asked to report their perceptions of other students’ engagement with the course, a less than optimal way to measure student engagement.

The Student Course Engagement Questionnaire (SCEQ) was chosen as a foundation because its creators contend that student course engagement consists of four factors: skills engagement (staying up on readings, putting forth effort); emotional engagement (making the course interesting, applying it to my life); participation/interaction engagement (having fun, participating actively in small group discussions); and performance engagement (doing well on tests, getting a good grade) (Handelsman, Briggs, Sullivan, and Towler, 2005, p. 187). These factors make not only intuitive sense as indications of a student’s active pursuit of learning in a course, but are grounded in theories of motivation, self, and mastery/performance orientations by students.

Next, a focus group of online instructors were asked what students who were engaged in an online course would “look like” in terms of skills, emotional, participation and performance engagement. The results of the focus group were used to adapt the Handelsman et al. instrument to the online environment. Some items, such as “Listening carefully in class,” and “Taking good notes in class” were replaced with items like “Listening/reading carefully” and “Taking good notes over readings, PowerPoints, or video lectures.”

Reliability of the pilot with 31 online students was strong (0.95) and the scale correlated strongly with two global items on engagement with the course ($r = 0.73$; $p < 0.01$) and two global items of social presence (getting to know other students and your instructor) ($r = 0.38$; $p < 0.05$), thus supporting face validity.

B. Data gathering.

Online instructors on multiple main and regional campuses of two large Midwestern universities were contacted to request they pass along an email/announcement to their students inviting them to complete the online survey of student engagement. Instructors were contacted via a teaching organization, by using the schedule of classes and by contacting teaching centers to ask them to pass along the request. To give instructors more incentive to participate, they were offered aggregate data from their own course if five or more students participated.

Participants. 186 students from six campuses and 38 courses completed surveys. The sample included students from courses in communication, economics, English, nursing, psychology, sociology, and tourism management. Because of the offer to share aggregate data with instructors and to lessen potential student fears about instructors’ abilities to identify individual student responses, no demographic data beyond campus and course were requested.

Scale validation. An exploratory factor analysis was run to validate the scale measurement of the four types of engagement: skills, emotional, participation and performance. As recommended by Allen, Titsworth, and Hunt (2009, p. 180-182), a predetermined number of factors (four) was entered into a principal axis factoring analysis with promax rotation. An item was only considered for a factor if it had a loading of 0.60 or higher on that factor and no secondary loading of 0.40 or higher. The results of the KMO and Bartlett’s Test were appropriate to continue the factor analysis. Nineteen of the thirty items loaded onto the four factors (see

Appendix A for KMO and Bartlett's Test results and pattern matrix of factor loadings). The 19 items yielded a Cronbach alpha of 0.91 and had a significant correlation with the global course engagement item ($r = 0.67$; $p < 0.001$). Therefore, only the remaining 19 items were used in the rest of the analysis See Appendix B for Online Student Engagement Scale).

Besides the scale of engagement and global engagement items, students were also asked three other questions: 1) What assignments, activities, requirements of this course helped/encouraged/required you to really think about and be interested in the content of the course (just list one or two)?; 2) What assignments, activities, requirements of this course helped/encouraged/required you to interact with the instructor (just list one or two)?; 3) What assignments, activities, requirements of this course helped/encouraged/required you to interact with other students (just list one or two)?

Analysis. The answers to the three open-ended questions were then grouped into categories of ways of communicating and/or activities. For instance, activities to engage with course content included quizzes/tests, papers, application of the content, discussion forums, projects, and lectures/connect session. Ways of interacting with other students included forums, group papers or projects, chats and connect sessions, e-mailing, and peer review. Ways of interacting with the instructor included chats and connect sessions, feedback on assignments, e-mail, forums, and lectures. There was a wide variety of activities in each of the three categories. For each student, the first activity they listed was the one coded.

III. Results.

RQ₁: What types of active learning in online courses do students report as engaging?

Students reported a number of types of activities as engaging. These included application activities (having to apply the concepts to case studies or problem solving); discussion forums about the concepts, labs and group projects, research papers, and current events assignments. To confirm that such active learning assignments are more engaging than passive learning assignments, an ANOVA was run to compare the engagement of students reporting Active activities (listed above) with those reporting Passive activities (reading, taking quizzes, watching/looking at PowerPoints or video lectures) and those reporting none (no activity was engaging). Students not answering the question were omitted from the analysis. There was a significant difference in the reported engagement of students reporting Active ($n = 102$; $M = 3.47$; $SD = 0.67$); Passive ($n = 36$; $M = 3.45$; $SD = 0.72$); and No engaging activities ($n = 8$; $M = 32.8$; $SD = 1.0$); $F (2,143) = 3.28$; $p < 0.05$. The Tukey HSD post-hoc comparisons indicate the significant differences occurred between active and none ($p = 0.03$; mean difference = -0.66) and between passive and none ($p = 0.05$; mean difference = -0.64). Therefore, only students who could report some type of activity which motivated them to interact with the content of the course (passive or active) were significantly more engaged than students who did not feel there were any such activities in the course.

RQ₂: Do highly engaged students report different activities than students who report less engagement?

None of the Chi Square tests run to determine if highly engaged students reported significantly different kinds of activities than less engaged students were significant.

The research question was answered in the negative. Highly engaged, those who reported engagement scores above the mean of 3.4, did not report significantly different activities than

students who reported low engagement: Chi-square (df = 10); 11.23; ns. Table 1 shows the chi-square results for activities by level of student engagement.

Table 1. Table for Course Activity by Level of Engagement.

Engagement Level	Course Activity										
	Lecture/ Webpages/				None Other Papers Project Quiz Readings Research						
	Missing	Application	Connect	Forums							Total
Low	15	12	2	6	5	11	4	4	4	7	6
High	9	13	9	14	4	15	8	7	3	6	12
Total	24	25	11	20	9	26	12	11	7	13	176

RQ₃: Do highly engaged students report different student-student communication activities than students who report less engagement?

The results for this question approached significance Chi-square (df = 7) = 14.03; p = 0.051. Both highly engaged and less engaged students reported similar channels of student-student communication: discussion forums, group work, peer reviews, and chat/connect sessions. However, highly engaged students were twice as likely to report using discussion forums to interact with other students and were the only students who reported web projects and webpages as a means of interaction. Table 2 shows the breakdown of student-student communication by level of engagement.

Table 2. Table for Student-Student Interaction by Level of Engagement.

Engagement Level	Student-Student Interaction Channel								
	Group				Peer				
	Missing	Chat/Connect	Forum	Projects	None	Other	Revisions	Webpages	Total
Low	15	3	15	3	20	12	8	0	76
High	16	2	29	5	14	12	12	10	100
Total	31	5	44	8	34	24	20	10	176

RQ₄: Do highly engaged students report different instructor-student communication activities than students who report less engagement?

This was not significant: Chi-square (df = 8) = 9.05 ns. Both sets of students reported email, feedback on assignments, connect/chat sessions, lectures and discussion forums as ways they interacted with their instructors. Table 3 breaks down the instructor-student communication by level of student engagement.

A. Follow-up.

Although students were requested to “ list one or two” activities or ways they interacted with fellow students or with instructors, many listed “none” (not the same as not answering the question), just one, or several. The fact that some would spontaneously list more than requested

Table 3. Student-Instructor Interaction by Level of Engagement.

Engagement Level	Instructor –Student Interaction Channel									Total	
	Feedback on Chat/ Missing Assignments			Email Forums			Lecture None Other				
	Connect	8	6	6	16	7	5				
Low	18	7	3	8	6	6	16	7	5	76	
High	17	16	6	18	8	8	9	11	7	100	
Total	35	23	9	26	14	14	25	18	12	176	

was somewhat surprising. Because of this, a follow-up test to compare the simple number of reported activities with reported engagement was run. Table Four indicates that students spontaneously reporting multiple ways of interacting with students and of communicating with instructors had significantly higher levels of engagement with the course in general than those who reported “None”. The finding suggests that multiple opportunities for communication may be more important than any particular channel. However, given that this was not a proposed research question, more data would need to be gathered to confirm this suggestion.

Table 4. Means for engagement based on number of activities reported.

Number of activities/communication methods reported	Content Activities	Student-Student Interaction	Instructor-Student Interaction
None	3.03	3.24	3.11
One	3.44	3.42	3.47
Two or more	3.51	3.73	3.70
F test	1.60	*3.46	**5.62
	df = 2, 148	df = 2, 143	df = 2, 143

*significant at 0.05; ** significant at 0.01

H_1 : Reported level of instructor presence will be significantly correlated with student engagement.

The hypothesis was supported. The mean for engagement was 3.41 (SD = 0.70) while the mean for instructor presence was 2.96 (SD = 1.24); $r = 0.41$, $p < 0.001$.

H_2 : Reported level of student presence will be significantly correlated with student engagement.

The second hypothesis was also supported. As stated previously, mean for engagement was 3.41 (SD = 0.70) while the mean for student presence was 1.83, not terribly high on a 5 point scale, (SD = 0.98); $r = 0.42$; $p < 0.001$.

IV. Discussion.

While the findings are somewhat disappointing, a couple of interesting results emerged from this study. First, the finding of no significant difference in student engagement levels between those reporting active vs. passive activities indicates that a myriad of content activities can be used to engage students in online courses. However, active learning assignments, particularly discussion forums and web pages, may serve the secondary purpose of helping to develop students’ social presence. Given the research regarding the potential for social isolation (Lewis and Abdul-Hamid, 2006; Ortiz-Rodriguez, et al., 2005; Russo and Campbell, 2004; Song and Singleton,

2004) of the online learner, instructors should consider learning assignments that engage students with the content and with each other. Across many types of courses when students readily identified multiple ways of interacting with other students as well as of communicating with instructors, they reported higher engagement in the course. The importance of this idea is further supported by the significant correlation of student course engagement with both the global item on instructor presence and the global item on student presence. So, instructors should consider assignments in which students interact with each other and the content of the course. Instructors need to create not just opportunities for students to interact, but the requirement that they do so. Students who are working on group projects together, doing peer review of one another's papers, interacting within a discussion forum on a particular topic, are likely to feel more engaged in the course. Simply offering the opportunity i.e., having an open discussion forum where they can (but are not required) to participate, is probably not enough.

Beyond this, the findings indicate instructors also need to provide multiple ways of interacting with students themselves to create their own social presence that the literature confirms is an integral component to a successful online course (Dennen, et al, 2007; Goertzen and Kristjansson, 2007; Hughes, 2007; Kehrwold, 2008; Shea, Li and Pickett, 2006). For instance, instructors need to use several channels: announcements on the homepage of the course delivery system, e-mails to students, discussion forums in which the instructor interacts, and online lectures or connect sessions and chats, to enhance engagement. However as stated earlier, the result that more channels of communication are reported by more highly engaged students cannot be considered with confidence until further testing is completed.

Clearly the path to student engagement, based on this data, is not about the type of activity/assignment but about multiple ways of creating meaningful communication between students and with their instructor – it's all about connections. While the study did not find specific activities that engage students more in an online course, it did yield some interesting insights into teaching online and the importance of social presence of both other students and the instructor.

Beyond the results of the study itself, the introduction of a scale to measure online student engagement is a step forward in our understanding of online teaching. The scale, with further validation, could prove very useful to research into online learning and teaching.

A. Limitations.

Limitations of the study are standard. While the sample is fairly good sized, all of the students are from a Midwestern Universities although the inclusion of both the main and regional campuses allows for varying sizes of campuses and a pool of traditional and nontraditional students. The primary limitation with this study is that in order to get at the information desired, a different methodological design may be indicated. To discover if discussion forums work better than e-mails for students interacting with each other, students using both will need to rate their relative effectiveness regarding course engagement.

B. Implications.

As usual, the study raises as many questions as it answers: confirming the importance of student to student interaction and instructor to student interaction but suggesting that more than one method for such interaction may be important for students to be engaged in the course. However,

findings indicate that particular types of activities are not necessarily more effective in engaging students in the online learning community. However, comparing assignments, which actively engage students with content and with each other against assignments that do not accomplish both of tasks, would be worth pursuing. Clearly, more research is desired and required.

In conclusion, this study emphasizes the importance of developing real connections in online courses. Instructors need to create active learning situations in which students can meaningful apply what they are learning. However, meaningful communication opportunities also need to be integrated into online courses. Such connections really help students to feel engaged with the courses they are taking despite the lack of a physical presence of instructor or other students.

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Appendices

Appendix A. Factor analysis Tables Online Student Engagement Scale (OSE).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.910
Bartlett's Test of Sphericity	Approx. Chi-Square	3281.745
	df	435
	Sig.	0.000

Pattern Matrix^a

	Factor			
	1	2	3	4
SE1		0.643		
SE2		0.643		
SE3				0.411
SE4		0.650		
SE5		0.647		
SE6		0.740		
SE7		0.942		
SE8		0.724		
SE9		0.453		
SE10			0.997	
SE11			0.986	
SE12			0.863	

SE13			0.560	
SE14			0.687	
SE15	0.500			
SE16	0.568			
SE17	0.678			
SE18	0.870			
SE19	0.623			
SE20			0.994	
SE21			1.000	
SE22			0.529	
SE23				
SE24	0.886			
SE25		0.394		
SE26	0.907			
SE27	0.569			
SE28			0.427	
SE29	0.682			
SE30	0.490			

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

- Rotation converged in 6 iterations.

Appendix B. Online Student Engagement Scale (OSE).

1. Making sure to study on a regular basis SKILLS
2. Putting forth effort EMOTIONAL
3. ~~Doing all the homework~~ SKILLS
4. Staying up on the readings SKILLS
5. Looking over class notes between getting online to make sure I understand the material SKILLS
6. Being organized SKILLS
7. Taking good notes over readings, PowerPoints, or video lectures SKILLS
8. Listening/reading carefully SKILLS
9. ~~Entering the online class multiple times a week~~ PARTICIPATION
10. Finding ways to make the course material relevant to my life EMOTIONAL
11. Applying course material to my life EMOTIONAL
12. Finding ways to make the course interesting to me EMOTIONAL
13. ~~Thinking about the course between times I am online~~ EMOTIONAL
14. Really desiring to learn the material EMOTIONAL
15. ~~Visiting or calling the instructor with questions about the material and/or assignments~~ PARTICIPATION

~~16. Emailing or posting questions when I don't understand the material and/or assignments~~
~~PARTICIPATION~~

17. Having fun in online chats, discussions or via email with the instructor or other students
~~PARTICIPATION~~

18. Participating actively in small-group discussion forums ~~PARTICIPATION~~

19. Helping fellow students ~~PARTICIPATION~~

20. Getting a good grade ~~PERFORMANCE~~

21. Doing well on the tests/quizzes ~~PERFORMANCE~~

~~22. Being confident that I can learn and do well in the class ~~PERFORMANCE~~~~

~~23. Taking advantage of all class resources (i.e., extra links, readings etc.) ~~SKILLS~~~~

24. Engaging in conversations online (chat, discussions, email) ~~PARTICIPATION~~

~~25. Critically thinking about my own ethics, priorities, beliefs and values in the context of the class ~~EMOTIONAL~~~~

26. Posting in the discussion forum regularly ~~PARTICIPATION~~

~~27. Emailing the instructor regarding my grade in the class ~~PERFORMANCE~~~~

~~28. Checking my grades online ~~PERFORMANCE~~~~

29. Getting to know other students in the class ~~PARTICIPATION~~

~~30. Assessing my own learning and progress in the class ~~PERFORMANCE~~~~

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